



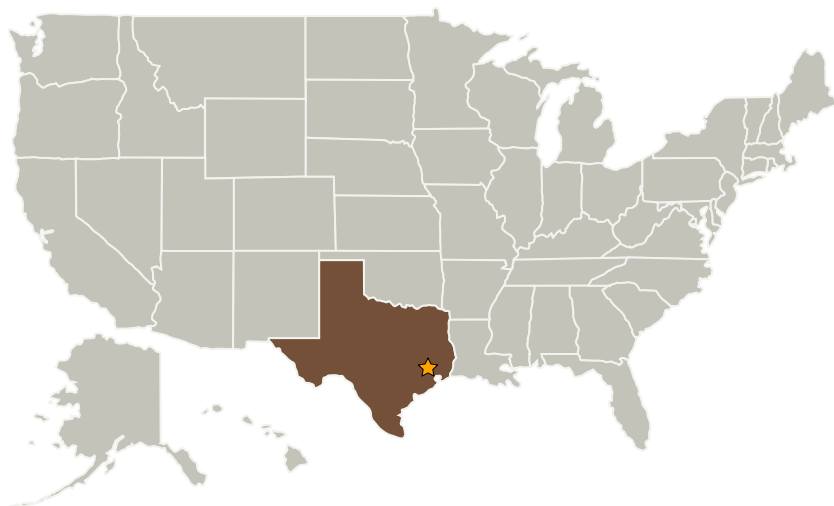
## Project Introduction

The antenna system on a small satellite is a critical component, as a failure of the antenna can lead to mission failure. Present antenna systems are typically wire 'whip' antennas that are fragile, prone to breakage, and are quite protrusive from the CubeSat body. The main objective of this research is to replace these off-the-shelf whip antennas with low-profile transparent microstrip antennas that are integrated into the frame of the CubeSat body, directly over the solar panels. The low-profile designs will not protrude from the CubeSat surface by more than 5 mm, and will be mechanically durable.

## Anticipated Benefits

The antennas resulting from this work will be low profile and integrated direction onto the CubeSat frame, giving much better reliability and compactness in the CubeSat design. This new approach to CubeSat antenna design is expected to result in a major paradigm shift in the way CubeSats are designed. Making the antennas reconfigurable will allow for the same antennas to be used for different frequency bands and different polarizations, making the CubeSats a versatile as possible. This will allow for next-generation communication capabilities that do not yet exist for CubeSats.

## Primary U.S. Work Locations and Key Partners



Development of Novel  
Integrated Antennas for  
CubeSats

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# Development of Novel Integrated Antennas for CubeSats


Completed Technology Project (2013 - 2016)




Organizations Performing Work	Role	Type	Location
★ Johnson Space Center(JSC)	Lead Organization	NASA Center	Houston, Texas
University of Houston	Supporting Organization	Academia	Houston, Texas

Primary U.S. Work Locations
Texas

## Project Transitions

 **October 2013:** Project Start

 **April 2016:** Closed out

**Closeout Summary:** Publications: <https://ntrs.nasa.gov/search.jsp?R=20150021839>

## Project Website:

<https://www.nasa.gov/directorates/spacetech/home/index.html>

## Organizational Responsibility

### Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

### Lead Center / Facility:

Johnson Space Center (JSC)

### Responsible Program:

Small Spacecraft Technology

## Project Management

### Program Director:

Christopher E Baker

### Program Manager:

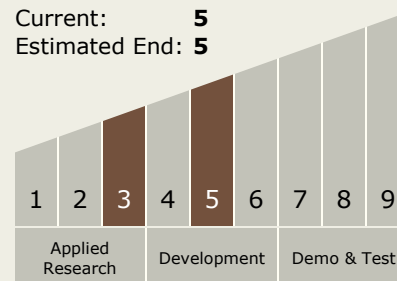
Roger Hunter

### Principal Investigator:

David Jackson

## Technology Maturity (TRL)

Start: **3**  
Current: **5**  
Estimated End: **5**



# Development of Novel Integrated Antennas for CubeSats

Completed Technology Project (2013 - 2016)



## Technology Areas

### Primary:

- TX05 Communications, Navigation, and Orbital Debris Tracking and Characterization Systems
  - └ TX05.2 Radio Frequency
    - └ TX05.2.6 Innovative Antennas

## Target Destination

Earth